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FINAL
NON-TYPICAL WASTE MANAGEMENT PLAN FOR THE WASTE PITS REMEDIAL ACTION PROJECT (WPRAP)

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
FERNALD, OHIO

JANUARY 2000

U.S. DEPARTMENT OF ENERGY
FERNALD AREA OFFICE

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List of Acronyms/Abbreviations

ACM	Asbestos Containing Material
ARAR	Applicable or Relevant and Appropriate Requirement
C	Compatible
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act, as amended
DOE	United States Department of Energy
DU	Depleted Uranium
FDF	Fluor Daniel Fernald, Inc.
FEMP	Fernald Environmental Management Project
ISO	International Shipping Organization
IT	IT Corporation
MHB	Material Handling Building
MSCC	Material Segregation and Containerization Criteria
NEC	National Electric Coil
NTS	DOE's Nevada Test Site
OEPA	Ohio Environmental Protection Agency
OU1	Operable Unit One
PCB	Polychlorinated Biphenyl
PID	Photoionization Detector
PPE	Personal Protective Equipment
RA	Remedial Action
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RLB	Railcar Loadout Building
ROD	Record of Decision
SAP	Sampling and Analysis Plan
TSCA	Toxic Substances Control Act
USEPA	United States Environmental Protection Agency (EPA)
WAC	Waste Acceptance Criteria
WAO	FDF Waste Acceptance Organization
WM	FDF Waste Management
WPRAP	Waste Pits Remedial Action Project

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1.0 INTRODUCTION

During the excavation of the waste pit area (i.e., Operable Unit 1) at the Fernald Environmental Management Project (FEMP), it is expected that a vast majority of the waste materials will either meet the Envirocare Waste Acceptance Criteria (WAC) or can be processed through the Operable Unit 1 (OU1) remediation facility such that it will meet the Envirocare WAC. There will, however, be wastes encountered during excavation which will not, even after processing through the OU1 remediation facility, meet the Envirocare WAC. This second group of wastes has been classified through the various OU1 (a.k.a., Waste Pits Remedial Action Project [WPRAP]) remediation documents as non-typical wastes. These items must be removed from the waste stream if encountered and managed in accordance with the appropriate regulatory requirements as identified in the Remedial Action (RA) Package ARARs Tables.

To date, information regarding the handling, management and transfer of non-typical wastes has been presented in various documents in the Remedial Design (RD) Package (e.g., in the Excavation Plan) and the RA Package (e.g., in the RA Health and Safety Plan). The purpose of this Plan, in part, is to consolidate all of this information on non-typical wastes into a stand-alone document.

In addition to consolidating the IT non-typical waste management activities into a single document, this Plan also provides details on other aspects of the management of non-typical waste, including the management of these wastes by Fluor Daniel Fernald (FDF) after transfer from IT. Specifically, this Plan provides information on how FDF's Waste Management (WM) organization will, as necessary, transport, store, treat (if required) and dispose of any non-typical waste generated through the OU1 remediation activities, once it has been excavated, packaged, etc., by IT. This Plan also provides general information associated with the oversight and assistance to be provided by FDF (e.g., FDF's Waste Acceptance Organization) to IT during the performance of its activities.

1.1 Project Background

The activities described in this Plan involve the remediation of OU1, which includes the remediation of Waste Pits Nos. 1 through 6, the Burn Pit, the Clearwell, contaminated soils beneath the pits, and soils from other FEMP projects (e.g., the OU1 Contaminated Soil Stockpile) at the former Feed Materials Production Center in Fernald, Ohio. This facility was formerly operated for and by the U.S. Government to process and produce high purity uranium metal and thorium products for the U.S. Department of Energy (DOE) and its predecessor agencies. The facility operated from 1952 until 1989, when production was discontinued. Since that time, the facility now known as the FEMP has been officially closed and is in the process of environmental restoration.

1.2 Site Description

The FEMP site comprises an area of 1,050 acres. The waste pits to be remediated under the OU1 scope of work are located to the northwest of the former Production area. During operations at

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the site, a wide variety of materials were disposed in the waste pits, but the overwhelming percentage of waste pit contents, both in mass and volume, is: general sump sludge; neutralized raffinate; and magnesium fluoride in the form of depleted slag, trailer cake, or slag leach slurry. Other materials disposed in the waste pits include water treatment sludge, graphite and ceramics, uranyl ammonium phosphate filtrate, thorium wastes, ash, fly ash, and depleted residues. Depleted residues were generated from the processing of depleted material. Also, the packaging of depleted products generated a wide variety of waste that includes, but may not be limited to, the following:

Contaminated rags, paper, and polyethylene
Contaminated asbestos material
Dust collector bags
Scrap salts (high in fluoride), including floor sweepings
Off-specification UF_4 or thorium tetrafluoride (ThF_4)
Contaminated soil, rocks, sand, brick, and ceramics
Furnace salt (solidified, non-chloride)
Dust collector residues (high fluoride, pyrophoric)
Dry crushed slag from furnace pot blowouts
Partially oxidized metal (containing no metal-x fire retardant)
Bad reductions (no derby)
Unrecycled slag (ball mill product)
Dirty prill (magnesium metal, high uranium content)
Reject UO_3
Drum decontamination residues
Magnesium oxide and magnesium zirconate from crucible clean out
Sludges (oily, high free metal)
Sludges (salt, soft, chloride)
Sludges (nonoily, low or high free metal)
Wet sump or trailer cake (with and without oil)
Scrap uranium oxide U_3O_8
Chips and turnings
Solid metal (other than ores) U_3O_8
Contaminated asbestos materials

Other materials that may have been discarded in the waste pits include small explosive devices (e.g., nail gun cartridges), drums, compressed gas cylinders, concrete debris, wooden pallets, transformers, and wastes that may be contaminated with PCBs.

1.3 Plan Overview

The primary objective of this Plan is to provide a complete presentation of information associated with the management of non-typical wastes encountered during the remediation of OU1. Therefore, the focus of this Plan becomes one of detailing the IT non-typical waste handling activities, with the following objectives:

- Provide a description of the non-typical waste types, including information regarding

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where each material may be encountered. (It should be noted that this information will be used as a tool to heighten awareness in certain locations, but that operators will always be alert to the possibility of encountering non-typical waste.)

- Describe how the non-typical waste materials will be recognized and identified by project personnel in the excavations or in the Material Handling Building (MHB).
- Present the strategy for sampling and analysis of non-typical waste material, by category.
- Identify handling requirements for the various types of non-typical wastes that will be utilized to minimize contact and ensure safety.
- Describe the means by which non-typical wastes will be removed intact from the waste pits in a safe and efficient manner.
- Describe the storage/staging procedures to protect non-typical waste materials from damage or environmental exposure prior to transfer to shipping containers, as well as describe how the waste will be managed so that releases or threats of releases to the environment are minimized.
- Present the criteria to be used to evaluate whether the non-typical waste can or needs to be processed prior to transfer and the methods by which the material may be processed.
- Provide information about the management of non-typical wastes by FDF, after it has been identified by IT, including how and where the material will be stored, disposed of, etc.

This Plan is comprised of the following four sections:

Section 1.0 Introduction - Provides a brief description of the project, and the purpose and scope of this Plan.

Section 2.0 Definitions and Categories of Non-Typical Waste - Describes the various types or categories of non-typical waste that may be encountered in the waste pits. In addition, this section provides information about where the particular non-typical waste stream could be expected to be encountered, and the hazards associated with the waste.

Section 3.0 General Requirements for the Operation, Handling and Management of Non-Typical Waste - Provides details relative to the general management of non-typical wastes, including roles and responsibilities, overview of detection methodologies, handling and transfer methodologies, initial identification of non-typical waste, hazard stabilization, material compatibility, interim storage, and transfer. Additionally this

section provides information on the management of these wastes by FDF, upon transfer from IT.

Section 4.0 Operational Methods for the Identification, Handling, and Management of Specific Non-Typical Wastes - Building upon the general requirements identified in Section 3.0, this section provides details on the requirements/plans which are specific to a particular non-typical waste stream (i.e., requirements/plans beyond those described in Section 3.0).

(End of Section)

2.0 DEFINITION AND CATEGORIES OF NON-TYPICAL WASTE

This section describes the various types or categories of non-typical waste that may be encountered in any location in the pits. As broadly defined, non-typical waste is waste that does not meet the Envirocare WAC or cannot be processed by IT to meet the Envirocare WAC, and thus will not be loaded into railcars, but will be turned over to FDF WM for handling, storage, disposal, etc. For the purpose of this document, and the activities detailed herein, the Envirocare WAC is defined as the WAC as it applies to IT's contract with FDF, and DOE's contract with Envirocare. Although Envirocare is able to accept RCRA wastes (under its licenses and permits), for example, RCRA waste may not be sent by IT to Envirocare, and would be considered non-typical waste.

Each of the following subsections includes a description of the specific non-typical wastes identified for WPRAP, the most likely locations where the waste may be found, and a description of the hazards associated with the waste. A summary of the information provided in the following subsections (i.e., the detailing of the waste categories by pit), is presented in Table 2-1.

It should be noted that although the discussions which follow provide indications of where non-typical wastes are most likely to be encountered, it is possible that any category of non-typical waste (as well as other wastes which would be non-typical) may be encountered in any location in the pits. In other words, although the text related to likely locations will assist operational staff, the operational activities will always be prepared to address any non-typical waste category in any pit location.

The following is a list of potential non-typical waste streams (although this list should not be considered all inclusive):

1) Pyrophoric materials
2) Compressed gas cylinders
3) Transformers and other forms of waste potentially contaminated with PCBs at levels of regulatory concern
4) Unopened, intact drums/containers, including an intact container within a drum (which in and of itself, may not be intact)
5) Large debris that cannot be size reduced to meet the Envirocare WAC
6) Thorium metal/oxides
7) Asbestos materials not meeting the Envirocare WAC
8) Small explosive devices (Fenwal Actuators and nail gun charges)
9) Waste from Railcar Loadout Building (RLB) bins determined through the chemical analysis of a representative sample, to be non-typical (e.g., RCRA characteristic, pyrophoric).

Specifics relative to the management of these waste streams, including methods of preventing or minimizing the hazards identified below, are provided in Section 3 of this Plan.

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Table 2-1
Summary of Non-Typical Waste by Pit

	Pit No. 1	Pit No. 2	Pit No. 3	Pit No. 4	Pit No. 5	Pit No. 6	Burn Pit	Clearwell
Pyrophoric Material	X	X	(1) O	(2) XX	(3) X	(4) XX	XX	O
	(1) None reported in Pit No. 3. (2) DU metal and fines, DU ingot, and magnesium reported in Pit No. 4. (3) DU ingots on east side of Pit No. 5. (4) 4 derbies and magnesium sludge (possibly in drums) in Pit No. 6.							
Compressed Gas Cylinders							XX	
Transformers							XX	
Unopened, Intact Drums	(5) XX	O	O	XX	O	(6) X	O	O
	(5) Drums along eastern edge of pit. (6) Magnesium sludge (possibly in drums) in Pit No. 6.							
PCB Waste							XX	
Large Debris				(7) XX				
	(7) Wooden boxes containing sealed jars of thorium metal fines in Pit No. 4.							
Thorium Metal or Oxides	X	O	XX	(8) XX	XX	O	XX	O
	(8) Wooden boxes containing sealed jars of thorium metal fines in Pit No. 4.							
Asbestos				(9) XX				
	(9) Asbestos used to wrap thorium metal fines in glass containers.							
Small Explosive Devices	O			(10) XX	O			O
	(10) 40 Fenwal actuators and 3 strips of nail gun cartridges (24/strip) in Pit No. 4.							

Notes identify items of non-typical waste and/or areas where waste was placed in the pits. Taken from various reports.

XX = Most Likely or Known to Contain Non-Typical Waste
X = Likely
O = Least Likely or Known to Not Contain Non-Typical Waste

A historical evaluation of past practices at the site has revealed some information indicating that small quantities of materials meeting the definition of RCRA listed hazardous waste may be present in the waste pit area. This information was summarized for the EPAs in a letter dated May 27, 1999. In addition to the potential for the presence of intact laboratory chemical containers in the pits (see Section 2.4), records also indicate that drums of potentially RCRA listed solvents (from the National Electric Coil [NEC] facility) were disposed of in the waste pit area. The most probable disposal location is in environmental media within the Burn Pit area, although one account by a worker on site at the time of disposal, suggests that the material was placed in soil trenches within the geographical confines of the Waste Pit 3 cap.

In that the excavation of the Burn Pit area is not scheduled until some time in 2003, a separate plan is currently being developed by FDF/DOE to investigate the extent of NEC solvent contamination in the Burn Pit area. This plan, and the activities defined therein, is outside the scope of the activities currently being performed by IT, and addressed in this Plan. Once drafted, this NEC solvents plan will be submitted to the EPAs for review and approval. Upon acceptance by the EPAs, the activities detailed in the NEC solvents plan will be implemented. Following the completion of the sampling and analysis activities (associated with the NEC solvents), a plan specific to the remediation of any RCRA listed solvents found through the investigation, will be developed for submittal to the EPAs for review and approval. Remediation of these RCRA listed solvents may also, if deemed more appropriate, be detailed through an amended to this Non-Typical Waste Management Plan.

In the meantime, to address the potential that the NEC solvents were disposed of in the Waste Pit 3 boundary, a heightened awareness will be maintained by field personnel of conditions indicative the disposal of these solvents. Specifically, historical documentation indicates that prior to the dumping of these solvents, wood pallets were laid down in a soil trench, crushed, and then covered with vermiculite. The solvents were then dumped on this wood and vermiculite, and covered with soil. Personnel engaged in the excavation and handling process for the Waste Pit 3 cap materials must therefore watch for the combined presence of both wood pallets and vermiculite. In the event this combination is identified, the excavation process in this area will be temporarily suspended until the material is evaluated for its potential to be classified as a listed hazardous waste resulting from the NEC solvent disposal activity. If the material is so identified, it will be segregated for transfer to FDF, for treatment and alternative disposition under applicable laws and regulations.

2.1 Pyrophoric Materials

As defined in the DOE Handbook "Primer on Spontaneous Heating and Pyrophoricity" (DOE-HDBK-1081-94), pyrophoric materials are those materials that may spontaneously combust upon exposure to air (atmospheric oxygen). For the WPRAP, the category of pyrophoric materials refers to uranium metals and alloys that produce a spark when struck with metal. Thorium, which is also considered a pyrophoric material, is covered in a separate category within this Plan. The uranium metal products that might exist in the waste pits include depleted uranium in metal form and as various compounds. In addition, individuals familiar with past operations at the site indicated that uranium products (e.g., derbies) in varying stages of physical condition were disposed in the pits. Uranium metals displaying pyrophoric properties

most likely would be larger pieces of uranium that were not fully oxidized prior to disposal in the pits and that were possibly covered by materials that would not facilitate further oxidation (by contrast, areas within the pit with oxidizing conditions would enable the uranium to "corrode" to the point that the pyrophoric properties would be diminished). These "inert" portions of the waste pits may still contain uranium metals that, when struck by a piece of equipment, such as an excavator bucket, will spark and possibly ignite.

The waste pits that would present the least concern of encountering pyrophoric uranium materials are Waste Pit Nos. 3, 5, and the Clearwell. The waste pits that present an increased potential for encountering pyrophoric uranium materials, are Waste Pits Nos. 1, 2, and 6. The waste pit that is believed to present the greatest potential for encountering pyrophoric uranium materials is Waste Pit No. 4. Reports confirm that there are metal and fines, at least one ingot, and magnesium in Waste Pit No. 4. In addition, based on the nature of the pit (i.e., its history of being a disposal area for laboratory chemicals), the Burn Pit would also present the greatest potential for encountering non-uranium or thorium metal, pyrophoric materials.

The primary hazard associated with excavation of pyrophoric materials is fire/explosion. Specifically, because the pyrophoric material may not be completely covered in an inert substance, the material may spark and begin combusting as soon as it is exposed, and/or struck by a piece of excavation equipment. Therefore, these materials will be handled in a manner which will prevent them from igniting due to excavation (or other material handling activities). The means by which this will be accomplished, as well as actions to be taken in the event of a fire/explosion, are described in Section 4.1 of this Plan.

2.2 Compressed Gas Cylinders

This category covers all vessels that were intended for use with any compressed gas. It includes any cylinders that are, or appear to be, intact and may or may not be under pressure. Such cylinders could have been used for nitrogen, oxygen, welding gases, etc. Even if the contents of the cylinder are not or were not considered hazardous (e.g., nitrogen), the cylinders themselves present a hazard as the physical condition of the cylinder is unknown and could pose a threat as a missile hazard due to the valve stem breaking off, or bursting. If the cylinder contained a toxic/deadly gas (e.g., chlorine), a release of the gas could be harmful/deadly to co-located workers and others for great distances (hundreds of meters).

No historical data has been located that indicates which waste pits may contain compressed gas cylinders. Based on its history as a disposal site for laboratory wastes, the Burn Pit may be assumed to be the most likely location to uncover compressed gas cylinders.

The primary hazard associated with compressed gas cylinders is the potential for exposure to toxic chemicals. However, based on the available records and the length of time that the cylinders have been buried in the pits (as much as 40 years), the possibility of encountering an intact pressurized cylinder is remote and the potential for encountering pressurized cylinders containing toxic gases is considered even more remote. Another hazard associated with compressed gas cylinders is the missile hazard. Specifically, because any cylinders disposed in the waste pits are likely to be partially (if not totally) corroded, any cylinder that is still under

pressure has an increased likelihood of the valve stem breaking off if knocked. The flying cylinder could injure an individual standing nearby. Also, the potential exists for the cylinder to burst if jarred. Metal fragments from the cylinder could cause injury if personnel are in the immediate area of the cylinder.

The methods to be used to manage compressed gas cylinders, including methods to mitigate the above hazards, are described in Section 4.2 of this Plan.

2.3 Transformers and PCB Waste

PCB wastes will generally be encountered in one of three ways: (1) as a transformer containing PCB-contaminated oils; (2) in intact drums; or (3) through bin sampling in accordance with the Sampling and Analysis Plan (SAP) for Waste Pit Materials. If a transformer containing PCB-contaminated oils is encountered, it will be managed in accordance with the methodologies discussed in Section 4.3 of this Plan. If a drum of PCB oil is encountered, it will be managed as an intact drum, as discussed in Sections 2.4 and 4.4 of this Plan. If, through the sampling of the waste pit materials in the RLB bin, it is determined that the waste is contaminated with PCBs such that it will not meet the Envirocare WAC, this material will be managed as discussed in Section 4.9 of this Plan.

No historical data has been found that indicates which waste pits may contain PCB waste. Although concentrations of PCBs are expected to be less than 50 ppm, the Burn Pit is the most likely location to uncover PCB wastes, since it was used to burn materials such as oils.

The primary hazard associated with handling PCB waste is the possibility of exposure to PCBs. In addition, PCBs that have leaked into the surrounding soil or pit material could make the soil or pit material a hazardous or mixed waste. Direct contact with the PCB waste will be minimized.

2.4 Intact Drums/Containers

This category covers any drums that are uncovered in a condition that would allow them to contain residual material. Such drums were possibly used for raw chemicals, waste, overpacking other drums, etc. In addition, this category includes any other intact containers such as those used for the storage and use of laboratory chemicals. These chemical/reagent containers may contain RCRA listed hazardous wastes.

Opened or partial drums/containers are considered to be typical waste in that they would be expected to contain waste material, which has co-mingled with the material found around the drum/container. In other words, the waste in the opened or partial container would be considered to be consistent with other wastes, unless there is some other apparent basis for determining it to be potentially non-typical (e.g., pyrophoricity). In addition, drums which are damaged or are not structurally stable such that they cannot be lifted by a drum grappler and placed in an overpack will be categorized as typical wastes and processed with the other pit waste streams.

Waste Pit No. 4 is known to contain two 55-gallon drums used to dispose of unoxidized thorium metal. Handling these drums will conform to the protocols for intact drums and for Thorium

Metal/Oxides. Waste Pit No. 4 is also known to contain other noncombustible trash in cans or drums. Waste Pit No. 1 may contain drums along the eastern edge of the pit. In addition, Waste Pit No. 6 contains magnesium waste that may still be in drums. The Clearwell, the Burn Pit, and Waste Pits Nos.2, 3, and 5 are less likely to contain drums.

The primary hazard associated with intact drums/containers is the fact that the contents are unknown and potentially hazardous. It is likely that the contents of any drum/container discovered in the waste pits are radioactive or hazardous. An additional hazard is the explosive potential of drums that are pressurized. Details associated with the handling of intact drums or containers, in order to minimize the potential of personnel injury, are discussed in Section 4.4 of this Plan.

2.5 Large Debris

Examples of materials that fall into this category include abandoned mechanical equipment and large sections of reinforced concrete. Pieces of concrete without reinforcement can be size reduced in the waste pit and handled as non-processable waste (i.e., waste which meets the Envirocare WAC, but cannot be processed through normal processing [e.g., through the dryer], because of its size, for example). If the concrete sections cannot be adequately size reduced in the pit using the bucket or blade of the heavy equipment, the material will be transported to a location where other dismantling methods can be used.

No historical data has been located that indicates which waste pits may contain large debris. The most likely location is Waste Pit No. 4, which is known to have been a dumping site for construction rubble.

The primary hazard associated with handling large debris is physical harm (e.g., being hit/cut by the material). Excavation of the debris will be performed such that personnel contact with the material is limited until the debris is in a flat, stable location (see Section 4.5 of this Plan).

2.6 Thorium Metal/Oxides

Thorium metals, oxides and powders are radiological hazards that may be encountered during excavation. Thorium oxide is not a pyrophoric material. Unoxidized thorium metal and powder/fines are pyrophoric materials. Thorium powder is a unique type of pyrophoric material in that it also presents an explosion hazard. Thorium wastes that may be encountered during excavation consist primarily of powders that were initially disposed in glass jars. These jars may or may not be in overpack containers (e.g., drums) and the jars may no longer be intact. Other thorium wastes include precipitated carbonate and sulfate sludge.

Reports indicate that several wooden boxes containing sealed jars of thorium fines were disposed of in Waste Pit No. 4. Thorium wastes were also known to have been disposed in Waste Pits Nos. 3 and 5, and Waste Pit No. 1 is suspect. The Burn Pit may contain thorium wastes because it is known that various pyrophoric and reactive chemicals were disposed in the Burn Pit. Waste Pits No. 2 and 6, and the Clearwell are less likely to contain thorium metal/oxides.

The primary hazard associated with excavation of thorium waste is fire/explosion. Because the powder may not be in sealed containers or completely covered in an inert substance, the material may spontaneously combust as soon as it is exposed. The methods to be used to manage thorium metals/oxides, including methods to mitigate the above hazards, are described in Section 4.6 of this Plan.

2.7 Asbestos

Asbestos can be found in many different forms. Asbestos was a common insulating material and was used for its flame-retardant properties.

Asbestos containing material (ACM) may be identified by the packaging and labeling of items that were disposed of in the pits. However, methods to recognize items that are not wrapped or labeled will be provided in training. Since asbestos has been used in a variety of materials, the method of recognition will be to list materials that could potentially be found in the pits.

For the purpose of WPRAP Operations, asbestos material will fall under one of two categories:

1. Regulated ACM (Regulated ACM is visually identifiable friable asbestos, e.g., piping and equipment insulation).

2. Non-Regulated ACM (Non-Regulated ACM is visually identifiable non-friable asbestos, e.g., transite).

Regulated ACM that can be visually identified, such as insulation, must be segregated from pit material. Non-Regulated ACM such as floor tile, transite, etc. does not need to be segregated from other pit material. However, Envirocare considers Non-Regulated ACM to be debris; therefore, the amount of Non-Regulated ACM per railcar must be accounted for in tracking the total debris volume.

Records indicate that ACM was disposed in Waste Pit No. 4, and may also have been used to wrap thorium metal fines that were placed in glass containers. Although the Burn Pit received various waste types, asbestos was probably not disposed in the Burn Pit, as materials that contain asbestos do not usually support combustion. The other waste pits are also less likely to contain asbestos.

The hazard associated with asbestos is inhalation and lung damage and standard project PPE provides suitable protection from asbestos hazards. The methods to be used to manage asbestos containing material, including methods to mitigate the above hazards, are described in Section 4.7 of this Plan.

2.8 Small Explosive Devices

Based on verbal reports of personnel who worked at the site at the time of disposal, there are two materials that were disposed in the waste pits that could be considered small explosive devices:

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nail gun charges and Fenwal actuators. This category also would pertain to any other materials uncovered that are believed to have similar properties.

Based on verbal accounts by current and former site personnel, approximately 40 Fenwal Halon actuators were disposed in Waste Pit No. 4. The actuators were used in the Plant 1 Titan Mill. The actuators contain lead azide, having an aluminum shell with insulated and covered copper leg wires that are connected to a four-pin receptacle. Each actuator contains a nominal explosive weight of 1.55 grains. Any materials even remotely matching this description will be treated as a small explosive device, as the actuators may no longer fit this description. There are no reports that such actuators were disposed in any other waste pit. The Burn Pit, Clearwell and Waste Pits Nos. 1 through 5 are considered the least likely locations to contain such actuators.

One verbal account suggested that at least three strips of nail gun cartridges with 24 cartridges per strip were sent to the waste pits for disposal, although it was not clear which waste pit was used. Waste Pit No. 4 is the most likely location for disposal of the nail gun cartridges, based on discussions with site workers present on site during the time of disposal. The Burn Pit, Clearwell and Waste Pits Nos. 1 through 5 are the least likely locations to contain these cartridges.

The primary hazard associated with excavation of small explosive devices is discharge or explosion. It is very unlikely that the Fenwal actuators will be discovered outside of their shipping/storage box. If they are found in their box, they will be kept in their box until disposal is completed. The methods to be used to manage these small explosive devices are described in Section 4.8 of this Plan.

2.9 RCRA/TSCA Waste

This category consists of those waste materials staged in the RLB bins that have been determined to meet the characteristics for RCRA hazardous waste and/or TSCA waste through sampling and analysis in the RLB bins.

The hazards associated with RCRA/TSCA waste are dependent on its chemical or physical properties. A waste may be RCRA characteristic because it is corrosive, reactive, ignitable, or toxic, or it may be a RCRA listed waste.

If RCRA/TSCA waste is encountered in the MHB or the waste pits (i.e., from intact drums), it will be properly packaged and transferred to FDF for treatment and/or disposal, as discussed in Section 4.9 of this Plan.

2.10 Other Non-Typical Wastes

There are other wastes which meet the definition of non-typical, but for which there is no documentation to suggest that they are present in the waste pits. These waste types are prohibited from disposal at Envirocare. These wastes include: medical/infectious waste, sealed sources or special form radioactive material, tires, lead acid batteries, and special nuclear material that exceeds the Envirocare total possession limit. If found in the waste pits, these other

non-typical wastes will be segregated, packaged, and transferred to FDF WM for appropriate treatment and or disposal.

(End of Section)

3.0 GENERAL REQUIREMENTS FOR THE OPERATION, HANDLING AND MANAGEMENT OF NON-TYPICAL WASTE

This section describes the various steps involved in the handling and management of non-typical waste, as it would generally apply to the management of any non-typical waste stream. Specifically, this section first provides details as to the roles and responsibilities of the various organizations involved in the management of these wastes, then goes on to provide general information on the process for identifying non-typical wastes, then the process for determining material compatibility and stabilizing hazards, and the process for handling and transferring the non-typical wastes, as well as the specifics associated with the staging of these wastes. Finally, this section provides information about how non-typical wastes will be managed by FDF, after transfer from IT. Particulars associated with the management of the specific waste streams discussed in Section 2 of this Plan, are then discussed in Section 4.0.

3.1 Management Roles

Management of non-typical waste from initial excavation in the waste pits to ultimate disposal will be performed by integrating the efforts of four major groups: IT; FDF WAO; and FDF WM; with overall coordination by FDF WPRAP. A brief summary of the role each of these four organizations will perform is as follows:

- **IT Corporation** will excavate, handle, identify, characterize (i.e., sample and analyze), stage, containerize, and transfer non-typical waste to FDF.

- **FDF Waste Acceptance Organization** will provide oversight and assist in the identification of non-typical wastes (e.g., as the "trained-eye" trainers). In addition, WAO will ensure that non-typical waste is segregated, marked/posted, documented, and transferred in accordance with applicable site and regulatory requirements. WAO also provides various tracking documentation associated with the identification, transfer, and storage of non-typical wastes.

- **FDF Waste Management** will accept non-typical waste from IT and will then store, treat (if necessary), package for offsite shipment, and arrange for ultimate disposal of the non-typical waste.

- **FDF WPRAP** provides the overall management and oversight of the remediation of the OU1 waste pits including proper management of non-typical wastes. As such, WPRAP will ensure the coordinated performance of activities between all parties (i.e., WM, WAO, and IT), providing needed project direction in the management of non-typical waste. WPRAP maintains direct operational, health and safety, and environmental compliance oversight of the IT field activities including non-typical waste identification, staging and transfer activities.

Non-typical waste will be managed in accordance with the OU1 Record of Decision (ROD), in that, as with other wastes originating from the waste pits, it will be disposed of offsite.

3.2 Identification of Non-Typical Wastes

Within the scope of excavating waste pit contents and blending or handling of the waste, several locations have been identified where non-typical waste may first be observed or identified. These are as follows:

- During excavation in the waste pits;
- When loading a dump truck;
- When dumping waste material into the MHB;
- When moving/handling material stockpiles;
- While screening waste material; and
- Following chemical analysis of a representative sample collected from an RLB bin.

At all but the last of these locations, potential non-typical wastes will be visually identified by personnel (generally the equipment operators) using "trained- eye" training. This training consists of instruction in the recognition of non-typical waste, through the use of pictures or drawings of the non-typical wastes, thereby ensuring that personnel are familiar with the physical make up (e.g., size, shape, color, etc.) of the wastes. These pictures/drawings will be kept in the cabs of excavators and other excavation equipment to provide a ready reference for the operators. In addition, field personnel will be informed of the probable location of non-typical waste. FDF WPRAP Operations Oversight and WAO personnel will also assist in the identification of non-typical wastes.

Upon observation of suspected non-typical wastes during pit excavation, the operator will temporarily interrupt excavation, attempt to visually confirm that the waste is potentially non-typical, and notify the IT Field Engineer or IT Blending Engineer by radio. Exiting the equipment for a closer examination will not occur, due to the potential for injury, or exposure to hazardous material or radiation. Therefore, binoculars or other devices that can aid the operator in viewing the item from the cab of the equipment may be used to help identify the waste as non-typical. If the operator is unable to confirm that the waste is non-typical, additional assistance will be provided by the Facility Engineer, Blending Engineer, or Safety & Health Representative to attempt to identify the waste and/or the structural integrity of the waste container.

If the remote visual assessment fails to provide sufficient information to positively identify the suspect non-typical waste and/or the structural integrity of the waste container, a closer assessment will occur. To perform this closer visual assessment, an entry team will be assembled, and the area around the suspect waste cordoned off. The entry team will inspect the suspect material/container for markings and/or labels (FDF WAO personnel will assist IT personnel by checking site data bases with any lot code or label information provided by IT). The exterior of the material/container, as well as the general area around the material/container,

will be surveyed using portable gamma spectroscopy, photoionization detectors (PIDs), oxygen monitors, and/or combustible gas detectors.

In the case of drums (as is discussed further in Section 4.4 of this Plan), further characterization will occur once it has been determined that it is safe to do so. In this situation, the drum will be punctured, after which further visual inspection and characterization will occur.

Once it has been determined that the non-typical waste is safe to move, or the waste has been reconfigured such that it is safe to move, it will be placed in the staging area that is set up in the pits or the MHB (see Section 3.4), and the operator will return to his previous activities.

Identification of wastes in the RLB bins will be through sampling and analysis activities performed in accordance with the SAP for Waste Pit Materials.

3.3 Hazard Stabilization and Material Compatibility

Once a non-typical waste has been identified (even if identification is tentative), and the instrumentation or visual inspection has identified potential problems, the hazards associated with the material will be stabilized. The exact measures to be employed for hazard stabilization will depend on the type of non-typical waste that is encountered, the condition of the material, and the type of hazard posed. Hazard stabilization may consist of covering pyrophoric materials with soil or waste, placing intact drums or transformers on plastic, containerizing bulging drums and puncturing the lid, protecting compressed gas cylinder valves, and size reducing or otherwise altering large debris.

In addition to stabilizing the hazards, only chemically compatible waste is staged close together in the pits and in the MHB. This segregation will be done either when the equipment operator makes the identification of the non-typical waste or following radiological surveys and characterization of the hazards using field instrumentation. Table 3-1 provides a compatibility matrix which can be used to initially segregate the non-typical waste that is uncovered.

3.4 Interim Staging of Potential Non-Typical Wastes

All potential non-typical wastes identified in the excavation and material handling activities will be placed in an interim staging location. The waste pit area will have an interim staging location for items discovered in the excavation process. The MHB will also have an interim staging location for items discovered inside of the MHB. The waste pit staging location will be at least 30 feet from the excavation working face, constructed on a compacted and level surface and will be relocated as the excavation process progresses (or as work changes within the MHB). Common features of the interim staging areas will be:

1) The area will be designated with high visibility markers, a boundary rope, and signs designating it as a non-typical waste interim staging area. Signs will also be provided to identify the contents of particular piles.

2) Segregation will be provided for potentially incompatible non-typical wastes.

Table 3-1
Waste Compatibility Matrix

	Pyrophoric materials	Compressed gas cylinders	Transformers	Unopened, intact drums/ containers	PCB wastes	Large debris	Thorium metal/oxides	Asbestos	Small Explosive Devices
Pyrophoric materials	C								
Compressed gas cylinders (See Note)									
Transformers			C		C				
Unopened, intact drums/ containers (See Note)									
PCB wastes			C		C	C			
Large debris					C	C	C	C	
Thorium metal/oxides						C	C	C	
Asbestos						C	C	C	
Small Explosive Devices									C

C = Compatible

Note: Compressed gas cylinders and unopened, intact drums/containers may be stored together if they contain compatible material as determined by markings or sample results.

3) Materials transferred to the interim staging area will either already be in overpack drums and containers, or the items will be placed on polyethylene sheeting. Drummed material suspected to be RCRA characteristic will be labeled and segregated accordingly.

4) Thorium fines contained within an intact drum will be overpacked and placed in a separate and isolated staging location with additional radiological controls for a radiation or high radiation area.

5) Routine inspections will be conducted and documented.

6) Water management and dust controls will be in accordance with the general project requirements and the specific pit area or MHB controls.

FDF will be notified of inventories of non-typical waste placed in interim staging areas. These interim staging areas will be assessed, as necessary, to assure that storage segments remain below a nuclear facility categorization per DOE-STD-EM-5502-94, "Hazard Baseline Documentation."

In addition, the interim staging area will be managed to ensure that stockpiles of non-typical waste do not exceed 100 yd^3. If necessary, this volume can be exceeded if IT notifies FDF prior to the pile exceeding 100 yd^3.

Non-typical waste materials will be staged in a designated portion of the excavation or MHB until final identification, sampling and analysis, hazard stabilization, or processing is complete. In general, non-typical waste will be staged in this interim location until there is a sufficient quantity of waste to accommodate transfer. It may, however, be necessary (e.g., to address safety concerns) to transfer waste sooner (e.g., upon generation). When transfer of the material is desired, FDF will be notified of the type of material being staged and an approximate quantity to enable them to select the appropriate containers. FDF will transfer the appropriate containers to the waste transfer station. The staged waste that is ready for transfer will be moved to the temporary storage and transfer location between Pits 4 & 6, as discussed in Section 3.5. Alternatively, a container may be taken to the staging area in the pit or the MHB, the waste loaded, and the container taken back to the temporary storage location after decontamination. This activity will be conducted such that cross-contamination does not occur.

3.5 Handling and Transfer of Non-Typical Wastes

The basic methodology for handling and transfer of non-typical waste involves the safe handling, staging and packaging of non-typical wastes for transfer to FDF. Once a non-typical waste is identified, it will be properly handled in accordance with waste type specific handling requirements and placed within an interim staging area (see Section 3.4) with other compatible wastes (see Table 3-1).

Depending on the specific waste type and associated hazards, the waste will be containerized or overpacked at the point of identification, at the interim staging location, or prior to transfer to FDF at the waste transfer location. Each container will contain only chemically compatible non-typical waste. Non-typical waste will be packaged per the Material Segregation and

Containerization Criteria (MSCC).

There are two potential methods of transferring non-typical wastes to FDF. The first means of transfer involves transporting the waste in a front-end loader, or with an excavator and grappler, to the area defined as the Waste Transfer Area (located between Waste Pits Nos. 4 and 6, adjacent to the access road), as depicted in Figure 3-1. There, the material will be placed in the appropriate container. This transfer method is preferred because the container does not enter the "hot" zone and therefore, may not need to be decontaminated. However, this method will be used only when it is safe to transport the material as described. The second method of transfer consists of taking the container into the excavation and loading the non-typical waste into the container at the staging area. The container will then be decontaminated before it is allowed to leave the waste pit area. Under all circumstances, placement of the material into the storage container will be performed with FDF concurrence that it is non-typical waste, and under FDF direction.

After the container has been loaded, and its exterior has been appropriately decontaminated to facilitate movement by FDF, the containerized waste will be transferred to FDF. The waste transfer from IT to FDF will occur at the Non-Typical Waste Transfer Area as depicted in Figure 3-1, whereupon, the waste will be managed by FDF WM, as discussed in Section 3.7 of this Plan.

The Non-Typical Waste Transfer Area will be established and operated as follows:

1) A level solid surface will be established for the Transfer Area, that is large enough to store the anticipated volume of Non-Typical waste. Other requirements of the RD Package will be followed to prepare the area, including preparing the area such that run-off is directed to a collection area that is destined for the IT Wastewater Treatment System.

2) The area will be identified with high visibility markers, such as stakes, cones, or highway drums, with a boundary rope around the area.

3) The storage and transfer area may be further demarcated to identify areas to keep incompatible waste material separated, including segregation of RCRA waste.

4) The transfer area will be routinely inspected to verify that the above items are in place and operating properly, and inspections will be documented.

5) Water management and dust controls will be in accordance with the general project requirements and the specific pit area or MHB controls.

3.6 FDF Waste Acceptance Organization Oversight

As indicated in Section 3.1 of this Plan, FDF WAO provides general oversight and assistance to IT, FDF WPRAP, and FDF WM, in the proper management of non-typical waste. In general terms, WAO provides oversight and assistance in the areas of non-typical waste identification,

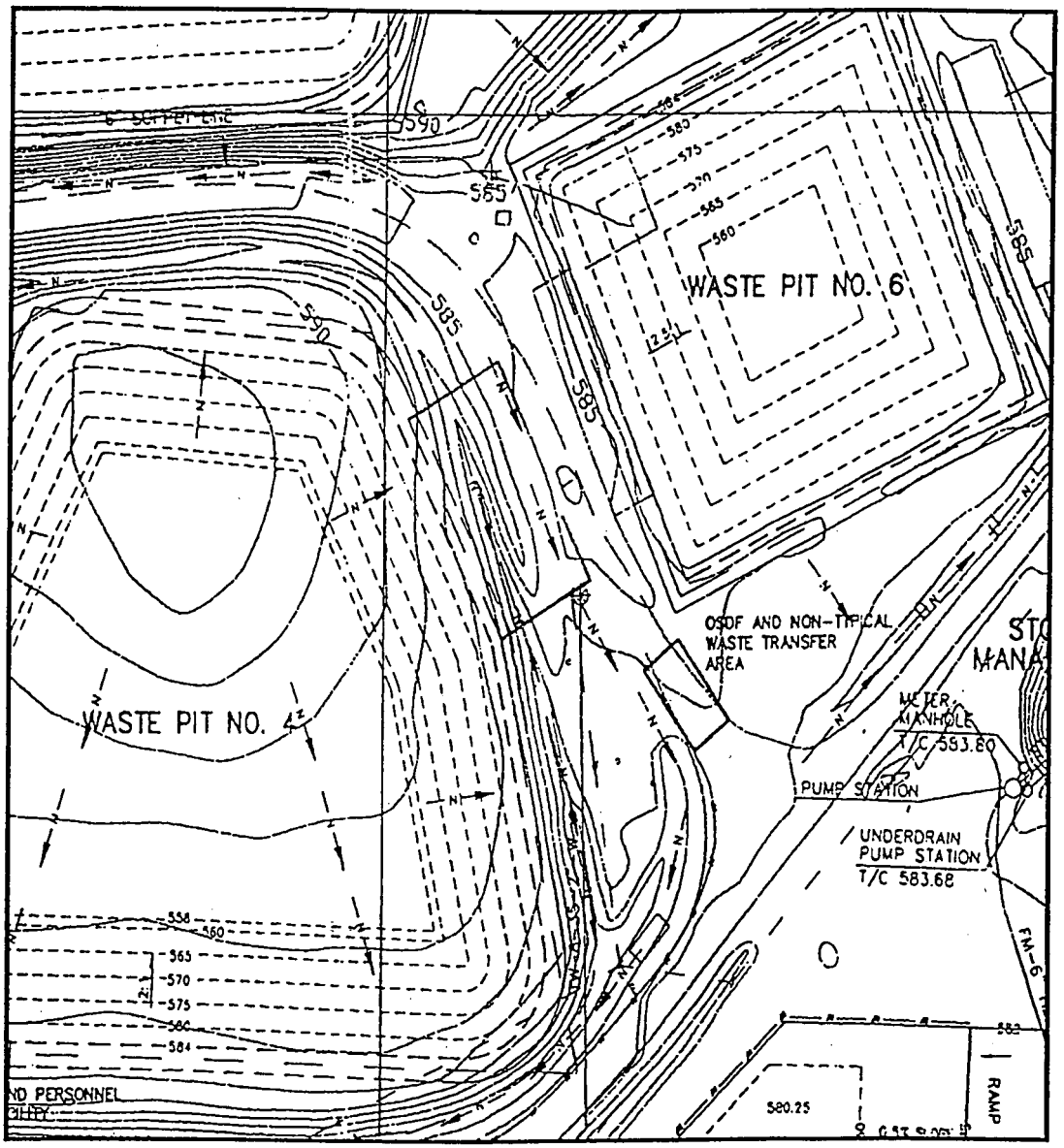

Figure 3-1 Non-Typical Waste Transfer Area

non-typical waste handling, and in the tracking of non-typical waste upon excavation, to ensure that this off-WAC material is appropriately segregated, staged, and provided alternate disposition. Specifically, WAO has the following responsibilities in support of the project:

- Assists in the identification/classification of waste materials. This assistance began with support in the "trained-eye" training discussed in Section 3.2. During excavation activities, WAO will be in the field providing additional assistance, as needed.

- Using the information gathered through the identification/classification process, WAO will work with FDF WM to determine what containerization requirements are appropriate for the specific non-typical wastes found, and then will formally request these containers from WM.

- Provides oversight of IT in ensuring that materials are appropriately segregated and stored, and that the storage piles and the storage area are appropriately delineated and managed (e.g., appropriate markers, signs, boundary ropes, etc. are used).

- Escorts truck movements of non-typical waste materials that require containerization, from the excavation area to the Non-Typical Waste Transfer Area, ensuring that the trucks/containers are properly placarded.

- Coordinates the movement and storage of containers with WM.

- Assists in the development of paperwork/records to support the transfer of non-typical waste to FDF.

- Completes field documentation, including tracking logs, on the transfer of the non-typical waste for storage.

3.7 FDF Management of Non-Typical Waste for Off-Site Disposal

As discussed previously, when materials from the waste pits are determined to be non-typical, when such waste has been containerized in FDF-supplied containers, and when the containers have been placed in the Non-Typical Waste Transfer Area, the responsibility for the management of this material will be transferred from IT to FDF, wherein it will be managed by the FDF Waste Management organization. In general terms, FDF WM will be responsible for providing the necessary containers for storage/shipment, for arranging for whatever interim storage is necessary on site, for performing any additional characterization deemed necessary to support disposal (after transfer from IT), for arranging any treatment necessary to support off-site disposal, and for arranging the ultimate disposal of this waste off-site. Details relative to these responsibilities are discussed in the following subsections.

3.7.1 Transfer/Receipt of Non-Typical Waste

To support the transfer of materials from IT to FDF, FDF WM will work with IT and FDF WAO to ensure that appropriate containers are provided for the non-typical waste, and that mechanisms

are in place to transfer those containers out of the waste pit area after packaging is complete. WM will become involved in the process as the non-typical waste is excavated, working with FDF WAO at this point in time, in determining container needs. FDF WM will provide containers to IT when a sufficient quantity of non-typical waste has been generated. FDF WM will provide these containers to IT at the Non-Typical Waste Transfer Area. To support the disposition (i.e., direct shipment) of this material off-site, FDF WM plans to prep the containers (e.g., with required adsorbent materials) prior to providing them to IT, in an effort to minimize double-handling of this material.

The container loading operations will also be performed in support of eventual off-site disposition. Specifically, containerization will be done in accordance with the MSCC, and loading activities will be performed so as to optimize the use of the container (i.e., the container will be filled such that the interior volume is as compactly loaded as practical up to the maximum gross weight of the container). In addition, for those containers which can be direct shipped (i.e., do not require storage on site) FDF Nevada Test Site (NTS) Compliance Group personnel will be present during the loading of the container by IT. In doing so, these individuals can certify that the container was loaded properly, thereby averting possible double handling of the material.

Following completion of all IT activities (e.g., loading operations, securing of the container(s), and any necessary decontamination of the container[s]), WM will be formally notified by IT of the types of containers and number of containers ready to be transferred from IT to FDF WM. Upon notification, WM will send the required vehicles and personnel to the IT Non-Typical Waste Transfer Area, to support the loading of the containers onto WM transfer vehicles, and the transport to the designated WM storage area (see Section 3.7.2). Any documentation developed in support of the non-typical waste determination, as well as other documentation necessary to support the off-site transportation and disposal, will be provided to FDF WM along with the filled container(s).

3.7.2 FDF WM Non-Typical Waste Storage

The materials transferred from IT to WM will be placed in the current inventory and entered into the appropriate waste stream for final disposition. The key facility to be used for the storage of these non-typical wastes, pending off-site disposition, is the Plant 1 Pad complex. Depending, however, on the characteristics of the material, the need for treatment, and specific disposal options/opportunities, the material may also be stored at other approved storage locations, such as Buildings 30A, 56, 68, 71, 80, and tension support structures 4, 5, and/or 6. No matter what the storage location, proper storage inspections, and monitoring, will be provided in compliance with State and Federal regulations. Materials will be stored at one or more of these locations (or any other approved location) until the proper characterization and treatment is performed (as necessary), and until off-site disposal is arranged.

3.7.3 Characterization/Treatment of Non-Typical Waste

In support of the off-site disposition of the non-typical waste generated through the OU1 remediation efforts, it may be necessary for WM to arrange for further characterization of the waste. Although the plan is to perform as much characterization as possible prior to transfer to

WM (as discussed in Sections 3.2 and 4.4 of this Plan), WM may find it necessary to perform additional characterization once waste management responsibility has been transferred from IT to FDF. For example, if a new treatment/disposal option becomes available, WM may be required to perform additional characterization to support this option (e.g., to determine its viability with respect to that waste stream). In addition, to support the off-site disposal of the non-typical waste, WM may also be required to treat the waste (e.g., to stabilize the waste).

3.7.4 Disposal of Non-Typical Waste

Waste Management's final responsibility will be to arrange for the proper disposal of any non-typical waste generated through the OU1 remediation activities. The final disposal location, however, will depend on the characteristics of the material, the volume of material, and/or the timeframe during which the material is excavated. At this time, viable options appear to be NTS, the Oak Ridge TSCA incinerator, DOE's "Broad Spectrum" projects, and Envirocare (through other contracts). As remediation progresses, however, other options may become available, and/or some of the currently planned options may no longer be available. Current plans for the disposal of specific non-typical waste streams are provided in the discussions in Section 4 of this Plan.

(End of Section)

4.0 OPERATIONAL METHODS FOR THE HANDLING AND MANAGEMENT OF SPECIFIC NON-TYPICAL WASTES

In Section 3.0 of this Plan, the general requirements of the identification, handling, staging, and transfer of non-typical waste were discussed. The purpose of this section, is to discuss requirements and/or plans which are specific to the identification, handling, staging, and transfer of a particular type of non-typical waste (i.e., requirements/plans beyond, or differing from, those described in Section 3.0).

4.1 Pyrophoric Materials

Oxidation is anticipated to have occurred within the waste pits and pyrophoric materials are not anticipated to be routinely encountered. Pyrophoric materials will be visually identified via display of pyrophoric properties (smoke, steam or fire) in the excavation and material handling activities, or via sampling and analysis of materials in the RLB bins. Any pyrophoric fires will be controlled using adjacent pit materials, magnesium fluoride or Metal-X™ fire extinguishers, and will then be handled by placing the material in an inert material such as sand for transport and placement in the appropriate storage container. Spraying a pyrophoric material with water to stop combustion will not work and may only make the problem worse by generating steam or spreading the material.

Pyrophoric materials will carefully be removed from the area where it was found, using heavy equipment with the appropriate attachments for the container that the waste is in, along with any soil that obviously contains the pyrophoric material. These materials will be placed in an appropriately sized container along with an extinguishing media such as sand and then transferred to the referenced segregated and demarcated staging area within the waste pits area. The staging area will be relocated within the pit area as the pit excavations progress. IT will remove the material from the staging area, overpack it into an FDF supplied container and transfer the material to FDF WM at the designated non-typical waste transfer point. The pyrophoric wastes will be removed by FDF WM and placed in interim storage at an approved location on the Plant 1 Pad. Under current conditions/plans, this material would be treated, as necessary, and disposed of at NTS.

4.2 Compressed Gas Cylinders

There are no documented records of full, partially filled or empty compressed gas cylinders being disposed of in the waste pits and cylinder encounters are expected to be rare to non-existent. Cylinders will be visually identified during excavation or material handling activities. Upon discovery of a cylinder, work in the immediate area will be stopped, and a remote visual assessment will be performed (see Section 3.2 of this Plan). If the cylinder appears to be, or is known to be leaking, the area will be evacuated and both IT and FDF will implement contingency plans and emergency response procedures.

Handling compressed gas cylinders remotely, and protecting the valve stem prior to moving them extensively are methods that will be used to minimize the potential of personnel injury due

to a missile hazard or bursting. Any cylinder transferred to FDF will be accompanied by supporting documentation defining the stability of the cylinder.

4.2.1 Cylinders Identified as Not Leaking

If, through the remote visual assessment, it is determined that the cylinder is not leaking, a two person team (one of whom is a cylinder specialist) in Level B protection, will inspect and assess the cylinder. The cylinder will be inspected for integrity, stability and damage, along with the marking labels, valve type and other physical features providing information on potential contents (e.g., design and construction materials). The inspection will also involve a check to see if a pressure release device is present, where it is located, and whether it is a plug, disk, or valve-type device. If deemed necessary and/or appropriate, the cylinder specialist may use an Ultra Sonic Wall Thickness Indicator to determine cylinder wall thickness.

In assessing the structural integrity of the cylinder, the cylinder will be checked for the following:

- Obvious signs of leakage;
- Deformations such as dents;
- Cuts, gouges, or digs, which may cut into or upset the metal of the cylinder, decreasing the wall thickness at that point;
- Corrosion or pitting, which could be indicative of a loss of wall thickness by corrosive material;
- Line corrosion, which could be indicative of cylinder weakness; and/or
- Weld defects, which could reduce the structural strength of metal.

Based on the above assessment, the cylinder will be categorized as either "restricted" or "unrestricted." The restricted category applies to cylinders with unknown contents, poor structural integrity, or are otherwise determined by IT to be unsafe for handling. The unrestricted category applies to containers with known contents, good structural integrity, or are otherwise determined by IT to be safe for handling (i.e., no valve).

Unrestricted cylinders will be remotely handled using a grappler and placed upright in a cylinder rack. The cylinder rack will be staged in a location surrounded by protective barriers, in case a cylinder were to burst. The protective barrier may be constructed of sand bags or equivalent material. Placing the cylinder in an FDF provided container is also considered an effective boundary. Unrestricted cylinders with contents that cannot be released to the atmosphere (e.g., toxic gas) will be stabilized by placing it in a safe configuration such as described above and further managed in accordance with a plan of action developed by FDF and IT, based on the particulars of the specific situation.

If a restricted category cylinder is discovered, the excavation work will be moved to a new location, the area around the cylinder will be protected with sand bags, or other means, and appropriately marked and identified, and a specialty cylinder remediation company will be contacted to provide technical and handling assistance. A restricted area, around the cylinder, will be established by the cylinder specialist using high visibility markers, placed at a safe distance from the cylinder. No work will be performed within the restricted area unless authorized by the cylinder specialist. A plan of action will be developed by the cylinder specialist, IT, and FDF, based on the particulars of the specific situation, with the disposal arranged through IT.

If the cylinder contents are known and it is determined that the contents (e.g., nitrogen) can be safety released into the atmosphere, the area around the cylinder will be positively identified using high visibility markers placed a safe distance from the cylinder, and access will be limited to those personnel who are directly involved in the cylinder venting activity. The cylinder will then be secured in a cylinder venting apparatus (e.g., cylinder coffin) to prevent the cylinder from becoming a "missile" when the containment is breached. Once secured, the cylinder will be breached using the excavator to break off the stem, thereby releasing the contents to the atmosphere. Once the pressure/contents have been released, the cylinder may be processed through the normal waste stream.

4.2.2 Cylinders Identified as Leaking

In the event that a leaking cylinder is encountered, the area will be evacuated and both IT and FDF will implement contingency plans and emergency response procedures. If, through the remote visual assessment, the contents of the cylinder cannot be ascertained, or it is determined that the contents cannot be released to the atmosphere, all personnel will evacuate immediately, an emergency will be declared, and appropriate emergency response actions (including notifications) undertaken. If, however, the assessment concludes that the contents of the cylinder are known and can be released to the atmosphere, and the cylinder is not out of control (e.g., missile, spinning, etc.), personnel will be evacuated from the immediate area until the cylinder has completed venting its contents. When the cylinder is empty, it will be processed through the normal waste stream.

4.3 Transformers and Other Forms of Potential PCB Wastes

Transformers and other forms of potential PCB wastes will either be visually identified during the excavation and material handling activities as a transformer or an intact, labeled drum, or via sampling and analysis in the RLB bins in accordance with the SAP for Waste Pit Materials. Intact, labeled drums will be managed as discussed in Section 4.4 of this Plan. Waste materials determined, via sampling and analysis in the RLB bins, to be PCB contaminated, will be managed as discussed in Section 4.9 of this Plan.

If, during the excavation or processing of the waste pit materials, a transformer (or capacitor) is encountered, it will be assumed to be filled with PCB fluid. The equipment operator will use an excavator with a grappler attachment or a forklift to relocate all transformers, including leaking transformers, and any adjacent stained soils or materials, to an in-pit staging area. The staging

area will be segregated and the materials will be placed on a polyethylene mat. The designated staging area will be relocated as the pit excavation progresses. IT will remove the material from the staging area, overpack it into an FDF supplied container and transfer the container to FDF WM at the designated non-typical waste transfer point. Liquid and solid PCB wastes will be placed into interim storage by FDF WM at an approved location on the Plant 1 Pad. Under current conditions/plans, WM would probably drain and rinse the transformer, returning the transformer itself to IT as a typical waste, and disposing of any PCB contaminated oils at the Oak Ridge TSCA incinerators. Any solids could possibly be disposed of through DOE's "Broad Spectrum" project.

4.4 Unopened, Intact Drums/Containers

Unopened, intact drums/containers will be visually identified in the excavation. Upon discovery of an unopened, intact drum/container (including an intact container within a drum [which, in and of itself, may not be intact]), work in the immediate area will be stopped, and a remote visual assessment will be performed (see Section 3.2 of this Plan). This assessment will be performed to determine the contents of the drum/container and its structural integrity to ensure that any further handling will not result in an unwanted release of the contents. The following guidance will be used to perform the assessment:

For Identification of Contents:

- Check the drum/container for labels or other markings that might identify the contents; and
- Observe the design, construction material, and condition. This may be helpful in identifying the physical form of the contents. For example, metal or plastic closed top drums with bungs usually contain a liquid, metal drums with plastic liners should contain liquids, fiber drums should have open tops and should contain solids, a bulging drum is an indication that the drum may be under pressure.

For Determination of Structural Integrity:

- Visually inspect to see if the drum shows any obvious signs of leakage;
- Check for missing or loose components (e.g., missing bung covers, loose locking rings);
- Check for deterioration (e.g., heavy flaking rust); and
- Check for exterior damage (e.g., heavy gouges, dents).

If the remote visual assessment fails to provide sufficient information to positively identify contents and structural integrity, a closer assessment will be performed. This closer inspection will be performed by a two person team in Level B protection. Initially, the drum/container will be surveyed with the field instrumentation for explosive gases, organic vapors and for the

presence of concentrated thorium (using portable gamma spectroscopy). In addition, the drum/ container will be visually inspected for labels, markings, lot codes, container type and features, along with signs of bulging, dents, gouges or other damage (as discussed above).

A drum that is damaged and breached, such that it has lost its physical containment capability, or does not have sufficient structural integrity to be lifted and placed into an overpack (i.e., the drum collapses during an overpack attempt), will be considered typical waste and will be processed with the rest of the waste streams from the waste pits. Based on field judgement, however, clearly anomalous material found in and around a breached or damaged drum may be segregated out and managed as potentially non-typical waste, if this segregation is deemed necessary in order to avoid possible WAC failure.

After the initial visual inspection, if necessary, the drum lid will be remotely punctured with a non-sparking brass punch to relieve the internal pressure and allow access to the drum. Once the drum has been punctured, a second assessment of the drum will occur. Field sampling involving the use of radiological instrumentation, a PID, combustible gas detector, pH paper and a flashlight for visual inspection of the contents will be performed. This activity will provide enough information to safely overpack the drum and move the drum to the non-typical waste staging area. If the drum contains a liquid, the opening that was created for sampling will be plugged with a wooden dowel or other appropriate material prior to transporting to the staging area. If the drum contains a solid, the opening will not be plugged.

When the visual assessment is complete, the results will be used to determine if the drum is to be categorized as either "restricted" or "unrestricted". As with the cylinders, the unrestricted category applies to containers with known contents, good structural integrity, or are otherwise determined by IT to be safe for handling. The restricted category applies to containers with unknown contents, poor structural integrity, or are otherwise determined by IT to be unsafe for handling. If a determination is made that the drum is restricted (i.e., it cannot be safely moved), the area where the drum was found will be positively identified with high visibility markers placed at a safe distance from the drum, and work will continue in a different location. IT and FDF management will then decide, on a case-by-case basis, how to proceed and safely remove and store the drum.

A correspondingly similar means of categorization has been adopted to establish the remaining activities to be performed in the management of unopened, intact drums. Specifically, at some point in the process, the drum will be categorized in one of the following ways: 1) unopened intact drums with known contents; 2) intact bulging drums; 3) unopened intact drums with unknown contents; or 4) unopened intact drums containing lab packs. Each of these categories of drum will be managed as discussed in the following subsections.

If intact containers are found, which are representative of those used for the storage and use of laboratory chemicals/reagents, they will be assumed to be non-typical. When such containers are encountered, personnel will be directed to: 1) suspend operations; 2) notify the supervisor or WAO; and 3) in conjunction with the supervisor and/or WAO determine the proper handling/ storage technique. The selected handling/storage protocol shall be implemented in a manner consistent with the identification of the waste as non-typical. Specifically, this material will be

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managed (e.g., staged, stored, disposed of, etc.) in accordance with all applicable RCRA requirements, as with any RCRA characteristic waste, as discussed in Section 4.9.

4.4.1 Unopened Intact Drums with Known Contents

If, at any point in time during the assessment process (as discussed above and in the discussions which follow), a decision is made that the contents of the drum are known, the drum will be managed based on whether is it known to be typical or known to be non-typical. This decision could be based on markings, labels, field screening, characterization, etc. If it is determined that the contents of the drum are typical, it will be blended with the other pit wastes. The empty drums will then be flattened (e.g., using the tracks of the excavator), one at a time or when a number of them have been accumulated.

If it is determined that the contents of the drum are non-typical, the equipment operator will transfer the drum to an interim staging area using a forklift or an excavator equipped with a grappler. At the staging area, the drum will be punctured (as discussed above) and placed in an FDF provided container (e.g., overpack), which will then be moved to a segregation area in the non-typical waste staging area. Sampling and characterization of the drum contents will be performed to gather information sufficient to: 1) verify the drum contents are indeed non-typical; 2) determine proper containerization of the waste; 3) determine compatibility with other stored wastes; 4) support waste treatment decisions (if necessary); and 5) support final disposal decisions. The list of constituents will be developed on a case-by-case basis, based on the results of the visual inspection, initial characterization efforts performed, and the above informational needs.

Drums containing non-typical waste will be transferred from IT to FDF WM in the Non-Typical Waste Transfer Area. The drum transfer will include appropriate documentation referencing the drum survey results, drum venting, drum characterization results and thorium survey results. If an intact drum of thorium fines is identified, a separate plan and radiological controls will be developed for the handling, transfer and disposition of this material. Overpacked drums will be placed into interim storage at an approved location on the Plant 1 Pad while FDF WM assesses treatment and disposal options. Under current conditions/plans, this material would be treated, as necessary, and sent to either the Oak Ridge TSCA incinerator, DOE's "Broad Spectrum" project, or Envirocare for disposal.

4.4.2 Unopened Intact Drums with Unknown Contents

Prior to removing an intact drum with unknown contents from the excavation area, the Equipment Operator, using an excavator and a brass drum punch, will puncture the drum to provide an access for field screening and/or sampling. After the drum has been punctured, field screening will be performed (as discussed in Section 4.4) with the use of a portable gamma spectrometer, a PID, combustible gas detector, pH paper and a flashlight. If, after having reviewed the field screening results, IT determines that the waste is non-typical, the drum will be managed as discussed in Section 3.2.4.1 of this Plan.

If, however, IT determines that the results of this screening are inconclusive (i.e., that further characterization is required), a sampling and analysis strategy will be developed which utilizes the results of the field screening, and is performed following standard methods. This strategy will be developed such that it provides sufficient information to make an affirmative decision as to whether the waste is non-typical, and therefore is to be transferred to FDF for management, or that the waste is typical and can be blended back in with the other waste pit materials. Once that information is gathered, and a decision can be made as to whether or not the waste is non-typical, the drum will be managed in the manner described in Section 4.4.1.

4.4.3 Intact Bulging Drums

Prior to removing an intact bulging drum from the excavation area, the Equipment Operator, using an excavator and a brass drum punch, will puncture the drum to relieve the pressure and to provide an access for field screening and/or sampling. After the pressure has been relieved, and if the contents of the drum are known, the drum will be managed as discussed in Section 4.4.1. If, however, the drum contents are not known, it will be managed as discussed in Section 4.4.2.

4.4.4 Unopened Intact Drums Containing Lab Packs

If, after a drum has been punctured (as discussed above), the drum is found to contain a lab pack, IT will make a determination as to whether the lab pack can or should be removed from the drum. This decision will be based on the accessibility of the lab pack, visual observation of the lab pack and whether or not the lab pack may be classified as a non-typical waste, and the physical state (solid or liquid) of other materials in the drum. In some cases, it may be possible to remove the lab pack without emptying the contents of the drum.

If IT determines that the lab pack is a non-typical waste, the lab pack will not be removed from the drum. The equipment operator will transfer the drum to the staging area using a forklift or an excavator equipped with a grappler. At the staging area, the drum will be placed in an FDF provided container, and transferred to FDF for management.

4.5 Oversized Debris

Whenever large debris (e.g., abandoned mechanical equipment, and large sections of reinforced concrete) is encountered, the Equipment Operator or other cognizant personnel will first notify the field engineer of the find and the location within the excavation where the material is located, and then continue to excavate to expose the large debris for further assessment. After the debris has been sufficiently exposed, a determination will be made as to whether the debris can be size reduced, and whether the handling of the debris will require special handling apparatus (e.g., rigging equipment, crane, etc.). As appropriate, the large debris will be size reduced in the pit using the bucket or blade of the heavy equipment. If the large debris cannot be adequately size reduced in the pit, the material will be transferred to a location where various hydraulic and mechanical size reducing equipment available for use on the project, can be used.

In the unlikely event that a visually identified object cannot be size reduced to meet the Envirocare WAC, the object will be moved to the non-typical waste staging area. The oversize

debris will be transferred to FDF WM for interim storage at an approved location on the Plant 1 Pad. Under current conditions/plans, this material would probably be disposed of at NTS.

4.6 Thorium Metal/Oxides

As discussed in Section 2.6 of this Plan, this category of non-typical waste involves radiological wastes that are generally pyrophoric, and may also present an explosion hazard. As such, these materials will be generally managed consistent with the practices discussed in Section 4.1 of this Plan. These materials will be identified via a combination of visual identification and the use of specialized radiological survey instrumentation (as discussed in Section 3.2 of this Plan). If identified via display of pyrophoric properties (smoke, steam or fire) in the excavation and material handling activities, or via sampling and analysis of materials in the RLB bins, efforts will be undertaken (as discussed in Section 4.1 of this Plan) to control the fire.

This material will carefully be removed from the area where it was found, along with any soil that obviously contains the pyrophoric material. This material will be placed in an appropriately sized container (e.g., an overpack drum or ISO container), covered with an inert material such as sand, and staged in a demarcated section of the non-typical waste staging area. This container will then be transferred to FDF WM where it will be placed in interim storage at an approved location on the Plant 1 Pad. Under current conditions/plans, this material would treated as necessary, and probably be disposed of at NTS.

4.7 Asbestos

Regulated asbestos containing waste not meeting the Envirocare WAC will be visually identified, wetted with amended water using typical garden sprayers or similar devices, and placed in double plastic bags or wrapped in 6 mil or heavier polyethylene and labeled. The wrapped and labeled regulated asbestos containing materials will be relocated to the staging area using forklifts, front end loaders or other excavation equipment. At the staging area, the regulated ACM will be placed in an FDF supplied container. The containerized waste will be transferred to FDF WM at the Non-Typical Waste Transfer Area, and moved to interim storage by FDF at an approved location on the Plant 1 Pad. Under current conditions/plans, this material would probably be disposed of at NTS.

Direct contact with the ACM will be minimized unless personnel handling it wear the proper PPE. Additionally, ACM should be kept wet or otherwise contained to minimize dust and airborne asbestos.

4.8 Small Explosive Devices

These items are small quantities of nail gun charges and halon fire-protection actuators reported to have been placed in the pits. Should these devices be encountered during excavation, operations in that area will immediately cease, and move to another area outside of the immediate vicinity of the suspect device.

When a notification is received that small explosive devices have been encountered, a visual

assessment will be performed to identify the device as either a Fenwal actuator or a nail gun cartridge. Due to the relatively small charge of explosives in these devices, either device can be safely handled provided the appropriate precautions are taken. These precautions may include using a long reach excavator bucket, front end loader bucket, etc. Once these devices have been identified, they will be removed from the area where found, using an excavator, front-end loader, bobcat, etc., with the appropriate machine attachment(s).

Fenwal actuators will be placed in their original shipping/storage container, if available. Otherwise, non-sparking tools will be used to place each Fenwal actuator in separate small plastic containers (5 gallon or less is recommended) with 2 to 3 inches of sand in the bottom. Nail gun cartridges may be placed in a single plastic container. The buckets will be placed in the non-typical waste staging area and subsequently transferred to FDF WM at the Non-Typical Waste Transfer Area. FDF WM will place the materials in interim storage at an approved location on the Plant 1 Pad while treatment and disposal alternatives are evaluated. Under current conditions/plans, this material would probably be disposed of at NTS after treatment.

4.9 RCRA/TSCA Wastes from the Railcar Loadout Bins

As specified in the SAP for Waste Pit Materials, samples of the waste material are collected from the RLB storage bins. If any of the samples fail the analysis as a RCRA characteristic waste, or as a TSCA waste, the waste will be turned over to FDF for subsequent handling and disposal. Once it has been determined that the contents of the bin does not meet the Envirocare WAC, one of the following three options will be exercised.

The first two options are based on a decision that all of the materials in the bin are non-compliant. In other words, either efforts will not be made to attempt to carve out non-compliance portions of the bin, or the results of such carve-out efforts have led to the conclusion that a carve-out is not possible. The difference between Option 1 and Option 2, is that under Option 1, the material will remain in the bin until it is loaded into the container for transfer to FDF, while under Option 2, the material will be transferred to the MHB, for temporary storage, prior to loading into containers for transfer to FDF.

Option 3 involves making an attempt to carve out the non-compliant portion of the bin. Given the significantly increased expense associated with managing this quantity of material (i.e., about 600 tons) as Envirocare non-compliant waste, this option would involve the taking of additional samples designed to isolate those portions of the 600 ton lot that are contributing to the non-compliance. If feasible, those portions causing the exceedence would then be segregated for management as Envirocare non-compliant waste. The specific approach for defining the extent of the problem will be developed if and when a non-compliant event occurs, after WPRAP has had further experience in managing operations of the OU1 process. This experience will allow WPRAP to determine accurate laboratory turnaround times, assess shift availability to perform the work, assess the overall project schedule status, and develop a plan appropriate to the project circumstances at the time of the actual event. Accordingly, at the time of the event, WPRAP will develop an isolation plan, submit it to OEPA/USEPA for review and approval, and proceed pursuant to Agency direction.

Under all of these options, the stockpiled non-compliant material will be placed into roll-off boxes, or other suitable containers, using a front-end loader. When a container is full (by weight or volume), it will be covered, appropriately placarded, and taken to the Non-Typical Waste Transfer Area. FDF WM will place the container(s) into interim storage at an approved location on the Plant 1 Pad while treatment alternatives are evaluated. Under each of these options, the RCRA stockpile area will be inspected per applicable RCRA requirements. Under current conditions/plans, this material would be treated, as necessary, and sent to an approved disposal facility, such as the Oak Ridge TSCA incinerator, DOE's "Broad Spectrum" project, or Envirocare for disposal.

(End of Section)